

***FINDING OF NO SIGNIFICANT IMPACT  
And  
DECISION RECORD***

***FOR***

***ENVIRONMENTAL ASSESSMENT  
FOR SPRING CREEK COAL LEASE MODIFICATION  
MTM-069782  
And  
Amendment to Land Use Lease MTM-74913  
EA# MT-DOI-BLM-MT-020-2010-29***

## **Finding of No Significant Impact / Decision Record**

### **Miles City Field Office**

#### **INTRODUCTION:**

The Bureau of Land Management (BLM) completed an Environmental Assessment MT-DOI-BLM-MT-020-2010-29 for the Spring Coal Lease Modification Application MTM-069782 and the application to amend Land Use Lease (LUL) MTM-74913. The Environmental Assessment (EA) analyzed the environmental impacts of modifying an existing lease, MTM-069782, to include a tract of Federal coal reserves adjacent to the Spring Creek Mine, an operating surface coal mine in the northwest Powder River Basin (PRB). The modification, if approved, would add approximately 498.1 acres that contain about 50.8 million tons of insitu coal.

The EA also analyzed the environmental impacts of assigning Spring Creek Coal Company's (SCCC) LUL MTM-74913 from Spring Creek Coal Company to Spring Creek Coal Limited Liability Company, renewing the land use lease for an additional 20 years and amending the lease to authorize the use of approximately 197.12 additional acres of public land for coal mine layback, construction of a flood control structure, placement of topsoil and overburden stockpiles, and establishment of transportation and utility line corridors in order to fully recover coal reserves from existing Federal Coal Lease MTM-94378 and Montana State Coal Lease C-1088-05, and from the above referenced pending lease by modification (LBM). If the amendment is approved, the LUL would total 222.12 acres. The land use lease tracts are referred to as the LUL tracts.

The legal description of the proposed coal lease modification as applied for by SCCC under the Proposed Action is as follows:

Township 8 South, Range 40 East, Big Horn County, Montana

Section 31: Lot 2	36.91 acres
Lot 3	36.97 acres
NW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$	10.00 acres
S $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$	20.00 acres
Lot 4	37.03 acres
SE $\frac{1}{4}$ SW $\frac{1}{4}$	40.00 acres
NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$	10.00 acres
S $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$	20.00 acres
SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$	10.00 acres

Township 9 South, Range 40 East, Big Horn County, Montana

Section 6: Lot 2	40.04 acres
Lot 1	40.05 acres
SW $\frac{1}{4}$ NE $\frac{1}{4}$	40.00 acres
NW $\frac{1}{4}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$	10.00 acres
S $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$	20.00 acres

Lot 4	37.09 acres
Lot 3	40.02 acres
N $\frac{1}{2}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$	20.00 acres
N $\frac{1}{2}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$	20.00 acres
NE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$	<u>10.00 acres</u>

**Total: 498.11 acres**

The legal description of the proposed LUL assignment, renewal, and amendment as applied for by SCCC under the Proposed Action is as follows:

Existing LUL:

Township 8 South, Range 39 East, Big Horn County, Montana

Section 22: N $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ , N $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$	25.00 acres
---	-------------

Additional LUL amendment area:

Township 8 South, Range 39 East, Big Horn County, Montana

Section 35: NE $\frac{1}{4}$ NE $\frac{1}{4}$	40.00 acres
SE $\frac{1}{4}$ NE $\frac{1}{4}$	40.00 acres
E $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$	20.00 acres
E $\frac{1}{2}$ W $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$	10.00 acres
NW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$	2.50 acres
NE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$	10.00 acres
NE $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$	2.50 acres
E $\frac{1}{2}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$	20.00 acres
E $\frac{1}{2}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$	5.00 acres
NE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$	10.00 acres

Township 9 South, Range 40 East, Big Horn County, Montana

Section 6: Lot 5	<u>37.12 acres</u>
------------------	--------------------

**Total: 222.12 acres**

The EA also analyzes the No Action Alternative and the Proposed Action with BLM imposed mitigation measures. The EA is attached to and incorporated by reference in this Finding of No Significant Impact (FONSI) determination.

#### **PLAN CONFORMANCE AND CONSISTENCY:**

The proposed project has been reviewed and found to be in conformance with the following BLM plans and associated Record of Decision(s):

1. Powder River Resource Management Plan and Record of Decision, March 1985

### **FINDING OF NO SIGNIFICANT IMPACT DETERMINATION:**

Based upon a review of the EA and the supporting documents, I have determined that the project is not a major federal action significantly affecting the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity, as defined in 40 CFR 1508.27, and do not exceed those effects described in the Powder River RMP. Therefore, an environmental impact statement is not needed. This finding is based on the context and intensity of the project as described below:

**Context:** The proposed actions would occur adjacent to the Spring Creek Mine, an operating surface coal mine in Big Horn County, Montana, which produces coal from Federal and State coal leases. The project, if approved, would add approximately 498.1 acres that contains about 50.8 million tons of insitu coal to existing Federal Coal Lease MTM-069782. The project would also amend (LUL) MTM-74913 and add approximately 197.12 additional acres of public land to the existing LUL (totaling about 222.12) for coal mine layback, construction of a flood control structure, placement of topsoil and overburden stockpiles, and establishment of transportation and utility line corridors.

The proposed project is near the Decker Coal Mine and the CX Field, a coal bed natural gas (CBNG) field that is also located in Big Horn County of southeastern Montana. The CX Field is an active gas field that produces coal bed natural gas from federal, state and private wells. There are also other producing CBNG fields in the general area. The Spring Creek Coal Mine is also within about 3 miles of the Tongue River Reservoir which includes the Tongue River Reservoir State Park.

**Intensity:** The following discussion is organized around the Ten Significance Criteria described in 40 CFR 1508.27.

#### **1. Impacts may be both beneficial and adverse.**

The proposed actions would impact resources as described in the EA. In addition to mitigation measures included in the project design, BLM developed additional mitigation measures to further minimize or eliminate adverse impacts to other resources and land uses. These additional mitigation measures are included in the Proposed Action Alternative. The EA also disclosed beneficial impacts from the proposed project to the local economy and to local, state and federal governments from increased revenues. The mitigation measures in the Proposed Action Alternative have been developed in close cooperation with the Montana Department of Fish, Wildlife and Parks and the Montana Department of Environmental Quality, Coal and Uranium Bureau, and are designed to minimize or eliminate adverse impacts. None of the environmental effects discussed in detail in the EA are considered significant.

#### **2. The degree to which the selected alternative will affect public health or safety.**

The Proposed Action Alternative is designed to minimize impacts to other resources as well as to public health and safety. The public generally cannot access the project area because access is restricted by the Spring Creek Mine. Security gates and a guard are located on the primary mine access road leading into the project area. Spring Creek Mine currently possesses all necessary

permits from numerous State and Federal agencies for protection of the environment and human health and safety from permitted mining activities. These permits include very stringent requirements that are closely monitored to insure compliance with the various terms and conditions. Surface disturbing impacts would not occur to the subject lands until such time as the modifications and amendments to the State and Federal mine permits allowing such activity are approved.

**3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas.**

The historic and cultural resources of the area have been reviewed by a BLM archeologist, the State Historic and Preservation Office, and affected Tribes. The potential impacts have been mitigated in the design of the Proposed Action Alternative. There would not be any effects on park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas, because none of these are located within or adjacent to the project area.

**4. The degree to which the effects on the quality of the human environment are likely to be highly controversial.**

Members of the public have not expressed concerns regarding potential impacts to groundwater, surface water, existing water rights, wildlife and quality of life in a predominately rural area. The Proposed Action Alternative includes mitigation measures that are designed to minimize or eliminate adverse impacts to resources and the quality of the human environment. SCCC is required to have all approved permits required by local, state and federal agencies with jurisdiction over components of the proposed project.

**5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.**

The proposed actions are not unique or unusual. The Spring Creek Coal Mine has been in operation since 1980. BLM has analyzed potential environmental impacts from other lease applications previously submitted for the Spring Creek Mine. The potential impacts associated with surface coal mines in general and this coal mine in particular have been described and analyzed in detail in other NEPA documents. The analyses showed that the proposed action does not involve highly uncertain, unique or unknown risks.

**6. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.**

The actions considered in the Proposed Action Alternative were considered by the interdisciplinary team within the context of past, present, and reasonably foreseeable future actions. Approval of the proposed actions would not set a precedent because the proposed action would authorize leasing of additional coal as well as amending the existing LUL at a coal mine with existing Federal coal leases which have undergone similar impacts. The proposal therefore, represents a continuation of reasonable and responsible surface coal mining operations, and does not establish a precedent for future actions. The decision does not constitute a decision in principle concerning a future action or consideration.

**7. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.**

The interdisciplinary team evaluated the proposed actions in context of past, present and reasonably foreseeable actions. The environmental analysis did not show significant effects from the proposed actions by themselves or in addition to past, present and reasonably foreseeable future actions in the general area.

**8. The degree to which the action may adversely affect districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.**

We applied the criteria for adverse effect and found the proposed Lease by Modification (LBM) will have an adverse effect to archaeological site 24BH3392. This site is a prehistoric cribbed log structure and occupation site that is recommended as eligible for listing on the National Register of Historic Places under Criterion D of 36 CFR 60.4. The site is recommended as eligible for NRHP listing for its ability to contribute to the understanding of the prehistory of southeastern Montana. Avoidance of the site was analyzed and found not to be economically feasible (see Section 2.3 of the EA). Prior to mining, the information contained in the site would be recovered through implementation of the Data Recovery Plan outlined in Appendix D of the EA. No other districts, sites, highways, structures, or other objects listed in or eligible for listing in the National Register of Historic Places will be adversely affected by the Federal action, nor will the action cause loss or destruction of significant scientific information. Loss of Site 24BH3392 will be mitigated through data recovery prior to mining.

**9. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.**

No endangered or threatened species or their habitat are known to exist within or adjacent to the project area.

**10. Whether the action threatens a violation of a Federal, State, Local, or Tribal law, regulation or policy imposed for the protection of the environment, where non-Federal requirements are consistent with Federal requirements.**

The proposed actions do not violate any Federal, State, Local or Tribal law or requirement imposed for the protection of the environment. State, local, and tribal interests were given the opportunity to participate in the environmental analysis process. Furthermore, the actions are consistent with applicable land management plans, policies, and programs.

**Summary of the Proposal**

SCCC has made an application to modify existing coal lease, MTM-069782, to include a tract of federal coal reserves adjacent to the Spring Creek Mine, an operating surface coal mine in the northwest PRB. The modification, if approved, would add approximately 498.1 acres that contains about 50.8 million tons of insitu coal.

They have also requested to assign Spring Creek Coal Company's LUL MTM-74913 from Spring Creek Coal Company to Spring Creek Coal Limited Liability Company and to renew the

land use lease for an additional 20 years. Spring Creek Coal Company also requested to amend the land use lease to authorize the use of 197.12 additional acres of public land for coal mine layback, construction of a flood control structure, placement of topsoil and overburden stockpiles, and establishment of transportation and utility line corridors in order to fully recover coal reserves from existing Federal Coal Lease MTM-94378 and Montana State Coal Lease C-1088-05, and from the above referenced pending LBM. The land use lease tracts are referred to as the LUL tracts.

Other than a narrow permitted pipeline corridor, the LBM tract and the LUL tracts are outside of the approved permit boundary for the Spring Creek Coal Mine. The mine is operated by Spring Creek Coal Limited Liability Company, a subsidiary of Cloud Peak Energy (CPE) and is located in T. 8 & 9 S., R. 39 & 40 E., Big Horn County, Montana, approximately 32 miles north of Sheridan, Wyoming. The approved Spring Creek Mine permit area includes 6,926 acres. On February 8, 2006, the Montana Department of Environmental Quality (MDEQ) approved Spring Creek Mine's current air quality permit to allow up to 24 million tons of coal per year to be mined. The mine produced 15.8 million tons in 2007 and 18.0 million tons of coal in 2008.

If Federal Coal Lease MTM-069782 is modified to include the proposed LBM and if LUL MTM-74913 is amended, SCCC would be required to revise its coal mining permit prior to mining the coal. As a part of that process, a revised mining and reclamation plan would be developed showing how the lands in the tracts that are leased would be mined and reclaimed. Specific impacts that would occur during the mining and reclamation of the tracts would be addressed in the mining and reclamation plans, and specific mitigation measures for anticipated impacts would be described in detail at that time. Specific mitigation measures have been developed via the environmental analysis process to eliminate or lessen potential impacts arising from leasing the coal and amending the LUL. Those mitigation measures will be attached as stipulations to the modified coal lease and LUL.

### **Decision**

Based upon the analysis of potential environmental impacts described in the April 2010, *Environmental Assessment for Spring Creek Coal Lease Modification MTM-069782 and Amendment to Land Use Lease MTM-74913* (Attached), it is my decision to select the Proposed Action Alternative from the EA and recommend approval of the modification to Coal Lease MTM-069782 and approve the amendment to Land Use Lease MTM-74913 inclusive of the attached stipulations.

Approved project components include:

- Modify Federal Coal Lease MTM-069782 by adding approximately 498.1 acres to it that contain about 50.8 million tons of insitu coal.
- Based on new studies, the lands included in the lease modification area and the land use lease amendment area are within an area recently identified as containing sage-grouse habitat. Since the habitat data are new, the coal unsuitability screen for wildlife, specifically Criterion 15 (43 CFR 3461.5(o)(1)), will be applied to lands impacted by the Proposed Action. These lands will be designated as *Unsuitable for Leasing With*

*Exceptions Applied*, and a stipulation will be placed on the coal lease and LUL amendment making the Habitat Recovery and Replacement Plan (HRRP) as described in the EA, a mitigation requirement of the leases.

- Amend LUL MTM-74913 to authorize the use of 197.12 additional acres of public land for coal mine layback, construction of a flood control structure, placement of topsoil and overburden stockpiles, and establishment of transportation and utility line corridors in order to fully recover coal reserves from existing Federal Coal Lease MTM-94378 and Montana State Coal Lease C-1088-05, and from the above referenced pending LBM.
- The existing LUL which expires on April 22, 2012, will be amended and renewed for an additional 20 years with an expiration date of April 22, 2032, and would be renewable.
- SCCC has two BLM issued *2920 Minimum Impact Land Use Permits* for environmental monitoring: 1) MTM-96659 in the E½, Section 35, T8S, R39E, and 2) MTM-96660 in Lots 3, 4, and 5, Section 6, T9S, R40E. SCCC proposes to retain the permit in Section 35 (MTM-96659), but would no longer need the permit in Section 6 (MTM-96660) if the coal lease modification and land use lease amendment are approved. Permit MTM-96660 will be relinquished by SCCC or allowed to expire.
- Spring Creek Coal Company's LUL MTM-74913 will be assigned from Spring Creek Coal Company to Spring Creek Coal Limited Liability Company.

A decision to modify Federal Coal Lease MTM-069782 and to Amend LUL MTM-74913 is a prerequisite for mining, but it is not the enabling action that would allow mining to begin. The BLM does not authorize mining operations within the tract by modifying and/or amending the leases. SCCC would be required to revise its State and Federal coal mining permit prior to conducting surface disturbing operations and mining the coal.

This Decision is effective immediately. Actions authorized by this Decision may begin immediately in accordance with any restrictions or constraints imposed by lease stipulations, permit conditions of approval, or surface owner agreements.

Approved By: s/Deborah K. Johnson  
Field Manager, Miles City Field Office

Date 4/12/2010

**Authorities:**

- Mineral Leasing Act of 1920 (MLA), as amended;
- Multiple-Use Sustained Yield Act of 1960;
- National Environmental Policy Act of 1969 (NEPA);
- Federal Coal Leasing Act Amendment of 1976;
- Federal Land Policy Management Act of 1976;
- Surface Mining Control and Reclamation Act of 1977 (SMCRA); and
- Energy Policy and Conservation Act of 2005.
  - Section 302 of the Federal Land Policy and Management Act of 1976 (90 Stat. 2762, 2763; 43 U.S.C., 1732).

**Compliance and Monitoring:** All Surface coal mines are regulated by various State and Federal agencies which require monitoring for a multitude of resources. The solid mineral staff at the Montana State Office of the BLM is charged with conducting production verification inspections on active Federal coal leases on a quarterly basis. Inspections for compliance with other surface disturbance related stipulations not covered by the mine permit are conducted on an as-needed basis by the BLM's Miles City Field Office.

In accordance with State and Federal regulations, the Montana Department of Environmental Quality, Coal and Uranium Bureau inspect the Spring Creek Coal Mine for compliance with the terms and conditions of mine permits on a monthly basis. Federal inspectors with the Office of Surface Mining Reclamation and Enforcement also inspect the mine on a yearly basis.

The mine is required via various permit conditions and regulations to monitor and report on impacts to a variety of resources some of which include groundwater, air quality, wildlife, mine related disturbances, reclamation, revegetation, and blasting.

Realty Specialists from the BLM are also required to inspect the area for compliance with lease terms and conditions of the LUL at least once every 5 years, and possibly more frequently depending on the level of activity.

**Terms / Conditions / Stipulations:** The following mitigation measures were analyzed in the EA and are included as Special Stipulations to the Coal and Land Use Leases;

## **APPENDIX A**

### **STANDARD AND SPECIAL LEASE STIPULATIONS DEVELOPED FOR THE LEASE BY MODIFICATION TRACT**

**SPECIAL STIPULATIONS** - In addition to observing the general obligations and standards of performance set out in the current regulations, the lessee shall comply with and be bound by the following stipulations. These stipulations are also imposed upon the lessee's agents and employees. The failure or refusal of any of these persons to comply with these stipulations shall

be deemed a failure of the lessee to comply with the terms of the lease. The lessee shall require his agents, contractors and subcontractors involved in activities concerning this lease to include these stipulations in the contracts between and among them. These stipulations may be revised or amended, in writing, by the mutual consent of the lessor and the lessee at any time to adjust to changed conditions or to correct an oversight.

**(a) CULTURAL RESOURCES -**

(1) Before undertaking any activities that may disturb the surface of the leased lands, the lessee shall conduct a cultural resource intensive field inventory in a manner specified by the Authorized Officer of the Bureau of Land Management (BLM) (hereinafter referred to as the Authorized Officer) on portions of the mine plan area, or exploration plan area, that may be adversely affected by lease-related activities and which were not previously inventoried at such a level of intensity. Cultural resources are defined as a broad, general term meaning any cultural property or any traditional lifeway value, as defined below:

Cultural property: a definite location of past human activity, occupation, or use identifiable through field inventory (survey), historical documentation, or oral evidence. The term includes archaeological, historic, or architectural sites, structure, or places with important public and scientific uses, and may include traditional cultural or religious importance to specified social and/or cultural groups. Cultural properties are concrete, material places, and things that are classified, ranked, and managed through the system of inventory, evaluation, planning, protection, and utilization.

Traditional lifeway value: the quality of being useful in or important to the maintenance of a specified social and/or cultural group's traditional systems of (a) religious belief, (b) cultural practice, or (c) social interaction, not closely identified with definite locations. Another group's shared values are abstract, nonmaterial, ascribed ideas that one cannot know about without being told. Traditional lifeway values are taken into account through public participation during planning and environmental analysis.

The cultural resources inventory shall be conducted by a qualified professional cultural resource specialist; i.e., archaeologist, anthropologist, historian, or historical architect, as appropriate and necessary, and approved by the Authorized Officer (BLM if the surface is privately owned). A report of the inventory and recommendations for protection of any cultural resources identified shall be submitted to the Western Regional Director of the Office of Surface Mining (hereinafter referred to as the Assistant Director) by the Authorized Officer. Prior to any on-the-ground cultural resource inventory, the selected professional cultural resource specialist shall consult with the BLM, the Northern Cheyenne Cultural Protection Board, and the Crow Historic and Cultural Committee. The purpose of this consultation will be to guide the work to be performed and to identify cultural properties or traditional lifeway values within the immediate and surrounding mine plan area. The lessee shall undertake measures, in accordance with instructions from the Assistant Director to protect cultural resources on the leased lands. The lessee shall not commence the surface-disturbing activities until permission to proceed is given by the Assistant Director in consultation with the Authorized Officer.

(2) The lessee shall protect all cultural resource properties within the lease area from lease related activities until the cultural resource mitigation measures can be implemented as part of an approved mining and reclamation plan or exploration plan.

(3) The cost of carrying out the approved site mitigation measures shall be borne by the lessee.

(4) If cultural resources are discovered during operations under this lease, the lessee shall immediately bring them to the attention of the Assistant Director, or the Authorized Officer if the Assistant Director is not available. The lessee shall not disturb such resources except as may be subsequently authorized by the Assistant Director. Within two (2) working days of notification, the Assistant Director will evaluate or have evaluated any cultural resources discovered and will determine if any action may be required to protect or preserve such discoveries. The cost of data recovery for cultural resources discovered during lease operations shall be borne by the surface managing agency unless otherwise specified by the Authorized Officer.

(5) All cultural resources shall remain under the jurisdiction of the United States until ownership is determined under applicable law.

(6) The mitigation plan found in Appendix D of the EA DOI-BLM-MT-020-2010-29 for Spring Creek Coal Lease Modification MTM-069782 for mitigating impacts to NRHP Cultural site (24BH3392) must be initiated and completed prior to surface disturbing activities occurring on the tracts.

(7) Prior to surface disturbance, the information for archaeological sites 24BH2530, 24BH2531, 24BH3388, 24BH3396, and 24BH3401 in Section 35, T8S, R39E will be updated. The purpose of the updating is to better refine the spatial extent and relationships between the sites, man-made disturbances, and Archaeological Site 24BH1589 on adjacent state lands.

**(b) PALEONTOLOGICAL RESOURCES -**

If a paleontological resource, either large and conspicuous, and/or of significant scientific value is discovered during construction, the find will be reported to the Authorized Officer immediately. Construction will be suspended within 250 feet of said find. An evaluation of the paleontological discovery will be made by a BLM approved professional paleontologist within five (5) working days, weather permitting, to determine the appropriate action(s) to prevent the potential loss of any significant paleontological value. Operations within 250 feet of such discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The lessee will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant interest discovered during the operation.

**(c) PUBLIC LAND SURVEY PROTECTION -**

The lessee will protect all survey monuments, witness corners, reference monuments, and bearing trees against destruction, obliteration, or damage during operations on the lease areas. If any monuments, corners or accessories are destroyed, obliterated or damaged by this operation, the lessee will hire an appropriate county surveyor or registered land surveyor to reestablish or restore the monuments, corners, or accessories at the same locations, using surveying procedures in accordance with the "Manual of Surveying Instructions for the Survey of Public Lands of the United States." The survey will be recorded in the appropriate county records, with a copy sent to the Authorized Officer.

**(d) RESOURCE RECOVERY AND PROTECTION PLAN (R2P2) -**

Notwithstanding the approval of a resource recovery and protection plan (R2P2) by the BLM, lessor reserves the right to seek damages against the operator/lessee in the event (i) the operator/lessee fails to achieve maximum economic recovery (MER) [as defined at 43 CFR 3480.0-5.2(21)] of the recoverable coal reserves or (ii) the operator/lessee is determined to have caused a wasting of recoverable coal reserves. Damages shall be measured on the basis of the royalty that would have been payable on the wasted or unrecovered coal.

The parties recognize that under an approved R2P2, conditions may require a modification by the operator/lessee of that plan. In the event a coal bed or portion thereof is not to be mined or is rendered unmineable by the operation, the operator shall submit appropriate justification to obtain approval by the Authorized Officer to leave such reserves unmined. Upon approval by the Authorized Officer, such coal beds or portions thereof shall not be subject to damages as described above. Further, nothing in this section shall prevent the operator/lessee from exercising its right to relinquish all or a portion of the lease as authorized by statute and regulation.

In the event the Authorized Officer determines that the R2P2 as approved will not attain MER as the result of changed conditions, the Authorized Officer will give proper notice to the operator/lessee as required under applicable regulations. The Authorized Officer will order a modification if necessary, identifying additional reserves to be mined in order to attain MER. Upon a final administrative or judicial ruling upholding such an ordered modification, any reserves left unmined (wasted) under that plan will be subject to damages as described in the first paragraph under this section.

Subject to the right to appeal hereinafter set forth, payment of the value of the royalty on such unmined recoverable coal reserves shall become due and payable upon determination by the authorized officer that the coal reserves have been rendered unmineable or at such time that the lessee has demonstrated an unwillingness to extract the coal.

The BLM may enforce this provision either by issuing a written decision requiring payment of the Minerals Management Service (MMS) demand for such royalties, or by issuing a notice of non-compliance. A decision or notice of non-compliance issued by the lessor that payment is due under this stipulation is appealable as allowed by law.

**(e) MULTIPLE MINERAL DEVELOPMENT**

Operations will not be approved which, in the opinion of the Authorized Officer, would unreasonably interfere with the orderly development and/or production from a valid existing mineral lease issued prior to this one for the same lands.

The BLM realizes that coal mining operations conducted on Federal coal leases issued within producing oil and gas fields may interfere with the economic recovery of oil and gas; just as Federal oil and gas leases issued in a Federal coal lease area may inhibit coal recovery. BLM retains the authority to alter and/or modify the R2P2 for coal operations on those lands covered by Federal mineral leases so as to obtain maximum resource recovery.

**(f) RECLAMATION/WILDLIFE -**

SCCC will be required to reclaim disturbed habitats within the areas designated as *Unsuitable for Leasing with Exceptions Applied* back to wildlife habitat as outlined in the Habitat Recovery and Replacement Plan (HRRP), which is included in part in Appendix B. This reclamation stipulation suffices for the needs of other wildlife species within the tract disturbance area.

To mitigate the loss of and replace habitats within the tract disturbance area delineated as valuable sage-grouse habitat (BLM 2006), SCCC will be required to adhere to terms of the HRRP, which is included in part in Appendix B.

**MTM-74913 SCCC Land Use Lease Assignment/Renewal/Amendment Stipulations**

- a. Land Use Lease MTM-74913 is being renewed for an additional 20 years, along with the amendment, and will expire April 22, 2032.
- b. This amendment is subject to the terms and conditions in 43 CFR 2920, the mitigations set forth in the application/plan of development, the stipulations and special conditions of the original lease, except Item (i) of "Section 3 – Restrictions on Use" of the original lease regarding reclamation is no longer in effect. Reclamation of the Federal land affected by the LUL will be in accordance with the Habitat Recovery and Replacement Plan (HRRP) and the reclamation plan, contained in the approved State and Federal Mine Permits.
- c. The Flood Control Structures will be constructed in accordance with the Mine Safety and Health Administration (MSHA) design and operation requirements.
- d. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder(s) shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, *et seq.*) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the Authorized Officer concurrent with the filing of the reports to the involved Federal agency or State government.
- e. The holder shall conduct all activities associated with the construction, operation, and termination of the land use lease within the authorized limits of the lease.
- f. The holder shall be responsible for weed control on disturbed areas within the limits of the lease. The holder is responsible for consultation with the authorized officer and/or local authorities for acceptable weed control methods.

- g. The holder shall coordinate with the parties holding authorized rights on the adjacent and affected lands [such as working out other grazing options with the grazing permittees/lessees].
- h. This land use authorization renewal and amendment are issued subject to a subsequent appraisal by a qualified appraiser of the Bureau of Land Management. The authorized user agrees to pay the Bureau of Land Management, upon demand, those fees determined in the appraisal to represent the fair market rental for the use of the public lands involved in this land use authorization amendment.

**APPENDIX B**  
**HABITAT RECOVERY AND REPLACEMENT PLAN**  
**REQUIREMENT FOR UNSUITABILITY CRITERION 15**  
**(From Management Situation Analysis (MSA) available at the BLM Miles City Field Office)**

- A. The lessee shall be required to mitigate for grouse habitat loss where applicable and the resultant loss or displacement of these species due to surface coal mining operation.

The habitat recovery and replacement plan shall indicate the methods to be employed by the lessee which will ensure that the recovered or replaced land has the capacity to support these species, as determined by Bureau of Land Management (BLM<sup>1</sup>) in consultation with the State of Montana.

Mitigation methods may require the lessee to employ techniques for wildlife range manipulation or intensive wildlife habitat range management. Habitat recovery or replacement may not be completely feasible in the permit area; therefore, recovery or replacement may be accomplished on lands made available through the surface management agency, the state or the lessee outside the permit area in combination with recovery and replacement methods on suitable lands within the permit area. In addition, habitat enhancement may be undertaken, outside the permit area, to accommodate or compensate for these displaced species that will move from the mining area during disturbance.

The habitat recovery and replacement plan shall consist of, at least, the following five parts:

1. A habitat analysis of the permit areas which:
  - a. Identifies the state wildlife species of high interest listed in paragraph A which occupy the permit area.
  - b. Includes an analysis of the quality of the habitat for those species.
  - c. Map and identify all riparian areas or mesic woody draws critical to the survival of these species.
2. A detailed description of the methods selected by the lessee to recover, replace or mitigate habitat loss, together with a comparative analysis of alternate methods which were considered and rejected by the lessee and the rationale for the decision to select the proposed methods.

The methods utilized by the lessee for recovery and replacement may include, but are not limited to, any of the following techniques:

- a. Increasing the quantity and quality of forage available to these wildlife species.
- b. The acquisition of critical wildlife habitat for the identified species.
- c. Mechanical manipulation of low quality wildlife habitat.
- d. Recovery, replacement or protection of critical wildlife habitat by selected fencing.

---

<sup>1</sup> Refer to page v for a list of abbreviations and acronyms used in this document.

- e. Development of grazing management system that will enhance the wildlife habitat potential.
  - 3. A timetable specifying that which will be required to accomplish the habitat recovery or replacement plan and showing how this timetable relates to the overall mining plan.
  - 4. An evaluation of the final plan by the BLM in consultation with the State of Montana. The State and BLM may comment on the methods selected and the techniques to be employed by the lessee and may recommend alternate recovery or replacement methods. If there are recommended alternative methods, the lessee shall consider those recommendations and, if the lessee rejects them, the lessee shall indicate its reasons as required by provision 2 above. If no State or BLM comment is included in the plan, the lessee will provide verification of its consultation with these agencies and the plan may be considered without comment.
  - 5. In the development of this plan, direct liaison with the State of Montana is essential.
- B. The stipulations set forth herein are not, in any way, intended to conflict with nor preempt the responsibilities of the Department of State Lands, nor any other state or federal agency, regulating surface coal mining and reclamation. Lessee shall comply with all valid and applicable laws and regulations of federal, state and local governmental authority.
- C. The authorized BLM officer shall provide written approval of the plan to the lessee. Resolution of conflicts, during development of this plan, will be brought to the attention of the authorized officer. Failure to resolve the conflicts or comply with agreements worked out under this plan will constitute noncompliance as described in Section 21 of the coal lease.

## **LEASE BY MODIFICATION MTM-069782 HABITAT RECOVERY AND REPLACEMENT PLAN**

**Note: The entire Habitat Recovery and Replacement Plan document, including attachments, maps, and supporting baseline habitat data, can be viewed at the BLM Miles City Field Office Montana Department of Environmental Quality/Coal and Uranium Bureau or is available in electronic format from the Miles City Field Office.**

### **Introduction**

On May 15, 2007, Spring Creek Coal Company (SCCC) submitted an application for a coal lease modification MTM-069782 in T. 8 S., R. 40 E., Section 31; and T. 9 S., R. 40 E., Section 6, Big Horn County, Montana. The lease by modification (LBM) encompasses approximately 498 acres adjacent to the current lease areas that would be mined in accordance with the requirements of Surface Coal Mine Permit #79012. The disturbance within and associated with this LBM is approximately 820 acres.

On March 4, 2009, SCCC submitted a proposal assigning Spring Creek Coal Company's Land Use Lease (LUL) MTM-74913 from Spring Creek Coal Company to Spring Creek Coal Limited Liability Company and renewing the land use lease for an additional 20 years and amending the lease to authorize the use of 197.12 additional acres of public land for coal mine layback, construction of a flood control structure, placement of topsoil and overburden stockpiles, and establishment of transportation and utility line corridors in order to fully recover coal reserves from existing Federal Coal Lease MTM-94378 and Montana State Coal Lease C-1088-05, and from the above referenced pending LBM. The disturbance within this LUL amendment area total approximately 197 acres.

The following document is a Habitat Recovery and Replacement Plan (Plan) that was developed through consultation with the Bureau of Land Management (BLM), Montana Fish Wildlife and Parks (MFWP), and the Montana Department of Environmental Quality (MDEQ). This consultation was necessary due to the requirements of the Unsuitability Criteria found in 43 CFR 3461.5(o) (1) which states in part “On some Criterion 15 acreage a lease may be issued if, after consultation with the MDEQ, the surface management agency determines that all or certain methods of coal mining will not have a significant long term impact on the species [sage-grouse] being protected.” The framework of this Plan follows the BLM’s Appendix II, Habitat Recovery and Replacement Plan Requirement for Unsuitability Criterion 15.

The Habitat Recovery and Replacement Plan for SCCC is based on a holistic approach that considers proper conservation practices for all species of concern, including the sage-grouse. SCCC will also continue to follow proactive practices, such as monitoring and treating for mosquito larvae in ponds and stored tires around the mine site to prevent potential West Nile Virus with potential impacts to sage-grouse. SCCC is including several conservation practices as determined through collaboration with MFWP, BLM, and MDEQ. Specifically, the Plan includes habitat analyses, enhancements to the current approved reclamation plan, and off-site mitigation options.

1. A detailed habitat analysis of the permit area will accomplish the following:

- a. Identify the state wildlife species of high interest listed in paragraph A which occupy the permit area.

The wildlife chapter in the Final Supplement to the Montana Statewide Oil and Gas Environmental Impact Statement (SEIS) and Amendment of the Powder River and Billings Resource Management Plans (December 2008a) addresses the sage-grouse as a State species of special concern (pages 3-118 through 3-125). Due to its location within baseline and annual survey perimeters, SCCC has monitored wildlife activity, including spring sage-grouse use, on the LBM every year from 1976 through 2008. Sage-grouse use of the LBM during other seasons was monitored with less regularity during that period. No sage-grouse leks have been recorded on the LBM surface during the last 33 years. SCCC will continue to monitor for sage-grouse and other wildlife species as per the Administrative Rules of Montana (ARM) 17.24.1129 and 17.24.751 through the life of the mine.

- b. Include an analysis of the quality of the habitat for those species.

It is shown in the Final SEIS on Map 3-13 (page 3-124) that the LBM is located within a “crucial sage-grouse habitat area” (CX Ranch B). SCCC conducted baseline permitting requirements (per ARM 17.24.304) in 2006/2007. These baseline studies were inclusive on numerous aspects including wildlife (Attachment 1 and Maps 1 and 2), vegetation and range analysis (Attachment 3 and Map 5), soils (Attachment 4 and Map 6), and water (Attachment 5). This data has been compiled and submitted to the MDEQ – Industrial and Energy Minerals Bureau; the wildlife component was included with the 2007 Annual Wildlife Monitoring Report (enclosed), submitted to MDEQ. The summary reports show sage-grouse have not used the LBM area for lekking activities, though less is known about other potential seasonal use. The LBM has been described as having very little, if any, surface water in the immediate area. Much of the vegetation within the LBM is comprised of sagebrush, cheatgrass, and other native and introduced plant species, and the draws and steeper aspect

areas include sporadic stands of trees (mostly juniper). These data have been submitted with the baseline studies. However, the influence of these physical characteristics on the presence/absence of sage-grouse in the LBM, beyond the spring display season, has not yet been determined.

- c. Map and identify all riparian areas critical to the survival of the species.

Per the baseline permitting requirements as stated above, riparian areas were dry and no apparent subirrigation was available to produce or support stands of succulent forbs. Twenty-three riparian areas were documented during the studies. There are various mesic woody draws along the drainages of the ephemeral Pearson Creek and its south tributary. Baseline studies (Attachment 2, Maps 3, 4, and 4a) have also documented 26 cliff features and 91 rock outcrop features in Sections 6, 31, 35, and 36 of the LBM area. Slope assessment also showed approximately 32% of the topography to be greater than 15% slope. Baseline drawings also show a predominance of juniper and pine trees along drainages that support raptor perching and/or nesting activity. These features are unattractive habitat for sage-grouse. These data have been submitted with the baseline studies to the MDEQ as part of revising the MDEQ mining permit. Permitting the LBM through MDEQ will include additional details on the plans.

2. A detailed description of the methods selected by the lessee to recover, replace or mitigate habitat loss; a comparative analysis of alternate methods that were considered and rejected by the lessee, and the rationale for the decision to select the proposed methods. The methods utilized by the lessee for recovery and replacement may include, but are not limited to, any of the following techniques:

- a. Increasing the quantity and quality of forage available to these wildlife species.

Sage-grouse utilize diverse forages and habitats during different seasons – for example: green forbs and grasses found in mesic habitats in spring and summer, forbs for brood rearing, and sagebrush leaves throughout the year, with almost total use during winter. Additionally, sagebrush provides an important yearlong habitat component for nesting cover, security cover, and thermal cover. The importance of sagebrush grasslands to sage-grouse is well documented; however, re-establishment of this habitat type has been met with varying degrees of success in coal mine reclamation. At SCCC, several reclamation techniques have also yielded varying degrees of success; however, the experimentation has led to the development of more than one successful technique (e.g., direct haul of platy soils, use of scoria and suitable spoil as a growth media, and use of seed mixes containing more shrubs with a reduced herbaceous component). One such reclamation example is Par 2C in Pit #1, for which SCCC received an Office of Surface Mining Reclamation award in 2005.

In recognition of the difficulties in establishing sagebrush, SCCC will continue to investigate several methods of sagebrush establishment. Improved methods may include considerations of focused timing windows for sagebrush seeding and modifications to seedbed preparation methods, among other potential options to enhance sagebrush establishment. Additionally, SCCC will evaluate enhancing specific areas of existing reclamation with sagebrush interseeding and or other normal husbandry practices. One experimental method will be conducted by chemically following pilot areas of reclaimed vegetation, followed by interseeding with sagebrush. Example pilot areas would consist of multiple plots covering less than one-half-acre each in Par 1E or Par 4B.

Prior to mining the baseline studies identified 626 acres of pastureland at SCCC. SCCC's Mining Permit #79012 includes a revegetation plan which establishes only 440 acres of pastureland in the postmine. As a result SCCC voluntarily replaced 186 acres of pastureland with other land use types which contain all native species seed mixes (South Fork Amendment, Application 174 approved 01/08).

Additionally, SCCC commits to revising their revegetation plan by removing the pastureland seed mix. This revision eliminates seeding future reclamation as pastureland on lands owned by SCCC. As a result, this revision will seed roughly 440 acres currently identified as pastureland with all native seed mixes such as sagebrush grassland, for example. SCCC will continue to confer with the MDEQ to obtain their approval to further revise the reclamation plan as part of permitting Application 183, the Pearson Creek Permit Amendment. This collaborative approach will assure the design addresses the diverse needs of all wildlife.

SCCC and MDEQ anticipate approval of Application 183 in 2009. Upon MDEQ approval, the revised reclamation plan will be incorporated into the mining permit. However, SCCC will work with MDEQ to approve sagebrush grassland or other native seed mixes which could potentially be applied in fall 2008.

b. Acquiring critical wildlife habitat for the identified species.

SCCC anticipates disturbing approximately 848 acres inside the crucial sage-grouse area associated with the mining activities within the LBM and LUL amendment areas. In 2007, SCCC donated \$135,000 towards the Montana Land Owner Incentive Program (LIP) as part of permitting Pit #4. SCCC will provide additional funding in the amount of \$12 per acre, or the established LIP payment rate, at the time these funds are needed, for each acre to be disturbed by the LBM mining activities. SCCC understands that offering a standard LIP program agreement to landowners in the area may be difficult. SCCC will work with MFWP to assist them with finding eligible lands for applying the pool of funds towards the LIP program or similar conservation efforts that will provide protection of sage-grouse habitat. Funds could be used to implement grazing systems, conservation easements, or to buy or retire private mineral leases, for example. SCCC offers to assist the BLM and MFWP in identifying landowners eligible for conservation programs, with an emphasis on lands inside the crucial sage-grouse areas and/or with active sage-grouse leks or identified winter ranges.

SCCC will work with the BLM and MFWP to find areas at least equal to the acreage disturbed by the LBM mining activity. At least one year prior to disturbing the crucial sage-grouse habitat within the LBM, SCCC will provide the MFWP with a list of landowners either within the lands identified as crucial sage-grouse habitat in the SEIS area or having similar habitat characteristics. This list of landowners will have been initially contacted by SCCC to introduce the conservation programs, and will include those individuals who have expressed an interest in participating.

c. Performing manipulation to improve habitat.

SCCC will provide MFWP and BLM with a manipulation study plan defining the treatment areas, methods of manipulation, and monitoring methods. The study plan will focus on areas of mature and/or low quality sagebrush stands in the LBM area. Additional lands beyond the LBM area will also be included in areas identified for habitat improvement; with agency approval, as opportunities and resources become available. The study plan will be approved by MFWP and BLM prior to implementation.

With agreement of the agencies, SCCC will study and assess manipulation beginning in 2009, after issuance of the LBM. A phased approach over several years will be used to assess various methods (including, but not limited to, size of area being manipulated, aspect of the terrain being manipulated, and manipulation techniques). Examples of manipulation include, but are not limited to, cutting, mowing, combining, fire, grazing, raking, harrowing, pitting, and aerating. The results will be used as a guide for the successful use of manipulation methods for future reclamation planning. Dependent upon the location of the vegetation being manipulated, the area could be assessed for response(s) over several years.

- d. Using selected fencing for recovery, replacement, or protection of critical wildlife habitat.

Fencing has been known to cause sage-grouse fatalities. SCCC will consult with the agencies to determine if removal of some fencing between Sections 36 and 31 would benefit the sage-grouse habitat. Fencing may be used to control grazing on grouse habitat. Any new fencing will be constructed to include wildlife friendly design.

- e. Developing grazing management systems that will enhance the wildlife habitat potential.

Properly controlled livestock grazing can be a useful land management tool for enhancing wildlife habitat. Grazing can stimulate the growth of grasses and forbs, which are important habitat components for a wide variety of wildlife species, including sage-grouse. Managed grazing can also contribute to the dispersal and fertilization of native seeds as livestock herds move through the area.

The LBM area has not been grazed by domestic livestock for the past two seasons, and grazing options are limited in that area due to the lack of natural streams and standing water. Current grazing agreements between SCCC and local ranchers are renewed annually. SCCC will work with the local livestock operator in the development of future grazing agreements in Sections 31 and 6 to ensure that they provide livestock forage while also enhancing the composition and structure of sagebrush grassland and other vegetation communities in the LBM. SCCC will seek flexibility in modifications to the timing and extent of the grazing program to adjust to natural conditions such as drought or excessive precipitation. That flexibility will ensure that grazing operations do not negatively impact wildlife habitat in the LBM area. Any changes in grazing use on BLM administered lands will be approved by the BLM's Miles City FO prior to implementation.

- 3. A timetable specifying what will be required to accomplish the habitat recovery or replacement plan and will show how this timetable relates to the overall mining plan.

Timetables specific to each item listed in provision 2 have been provided. The current mine plan proposes mining activity in the LBM area starting in 2012 and continuing through end of mine life in late 2028. This does not take into account potential future coal leasing activity. That potential is unknown at this time due to several factors of uncertainty. As previously described, the reclamation plan has been revised *as part of this mitigation plan* to include additional native seed mixes to create a mosaic of wildlife habitat; for example sagebrush grassland. These revised reclamation practices, as well as experimental manipulation practices, which prove to be successful, will be applied to areas currently being mined. As mining advances into the LBM area, reclamation will follow the approved plan. Phase III bond release signifies that MDEQ has approved the satisfactory establishment of post-mining vegetative composition and cover. The bonding period is a minimum of 10 years after the reclaimed area has been re-topsoiled and

seeded. Final habitat recovery will be achieved during Phase IV bond release of the current mining areas and the LBM area. Relative to reclamation of wildlife habitat, the Administrative Rules of Montana, at 17.24.1116 (6)(d)(ii) outline that the applicable reclamation bond will not be released until fish and wildlife habitats and related environmental values have been restored, reclaimed, or protected in accordance with the Act, the rules, and the approved permit.

SCCC will continue to minimize surface disturbance by limiting the disturbance areas necessary for mining and mine related activities.

SCCC will continue to treat for mosquito larvae in ponds and tires stored around the mine site to prevent potential West Nile Virus impacts to sage-grouse.

In addition to standard monitoring efforts, SCCC will implement an expanded winter/spring wildlife monitoring plan for sage-grouse during 2008. This plan (Attachment 6 of the complete plan available at the Miles City Field Office) has been approved by BLM, MFWP, and MDEQ and initiated. The need for additional sage-grouse monitoring in future years will be reviewed with the agencies following the results of the enhanced 2008 monitoring efforts.

4. An evaluation of the final plan by the BLM in consultation with the State of Montana.

The MDEQ and BLM may comment on the methods selected and the techniques to be employed by the lessee and may recommend alternate recovery or replacement methods. If there are recommended alternative methods, the lessee shall consider those recommendations and, if the lessee rejects them, the lessee shall indicate its reasons as required by provision 2 above. If no MDEQ or BLM comment is included in the plan, the lessee will provide verification of its consultation with these agencies and the plan may be considered without comment.

The final Habitat Recovery and Replacement Plan will include recommendations received from the different agencies.

5. In the development of this plan, direct liaison with the MDEQ is essential.

SCCC will continue to work with the MDEQ, MFWP, and BLM in the development of the plan.

### **Status of HRRP Updated June 2009**

Subsequent to development of the HRRP, SCCC has completed several of the commitments made in the HRRP.

- Item 2a. MDEQ approved minor permit revision on September 29, 2009 granting approval to remove the pastureland seed mix. The minor revision also included the addition of a sagebrush-forb mosaic native seed mix. Three acres of this seed mix was applied to permanent reclamation in the fall of 2008.
- Item 2c. SCCC prepared a Manipulation Study Plan on April 26, 2009, which is being reviewed by BLM and MFWP.

## **APPENDIX D**

### **CULTURAL RESOURCE DATA RECOVERY PLAN FOR PISTOL PETE SITE 24BH3392**

**CULTURAL RESOURCE DATA RECOVERY PLAN**

**for**

**PISTOL PETE SITE 24BH3392**

**for**

Rio Tinto Energy America's  
Spring Creek Coal, LLC  
Decker, Montana

Prepared by

GCM Services, Inc.  
P. O. Box 3047  
Butte, MT 59702

June 2009

## TABLE OF CONTENTS

INTRODUCTION	D-1
PISTOL PETE SITE DESCRIPTION	D-1
Expected Cultural Deposit Characteristics at 24BH3392	D-5
SITE CONTEXT FOR 24BH3392	D-5
RESEARCH GOALS AND SPECIFIC HYPOTHESES	D-6
Cultural Chronology	D-7
Site Function	D-7
Subsistence	D-8
Seasonality	D-9
Site Structure and Social Organization	D-9
Paleoenvironment	D-11
Intersite Relationships	D-11
GENERAL EXCAVATION PROCEDURES	D-11
Mapping	D-11
The Grid	D-11
Vertical Control	D-12
Features	D-12
Field Notes	D-12
SITE SPECIFIC EXCAVATION PROCEDURES FOR 24BH3392	D-13
GENERAL METHODS OF ANALYSES	D-14
Lithic Analysis	D-14
Faunal Analysis	D-14
Macrofloral Analysis	D-15
Pollen Analysis	D-15
Wood Speciation	D-15
Radiocarbon Dating	D-15
Dendrochronological Dating	D-15
Obsidian Trace Element Analysis	D-16
Obsidian Hydration Band Analysis	D-16
Protein Residue Analysis	D-16
Ceramic Analysis	D-16
Feature Analysis	D-16
SCHEDULE	D-16

Appendix A: Site Form

**LIST OF FIGURES**

Figure 1.	The location of 24BH3392 on the USGS 7.5-minute maps <i>Pearl School</i> (1967) and <i>Decker, Montana</i> (1967).....	D-2
Figure 2.	Site overview looking north at landform from the upper bench.....	D-3
Figure 3.	Looking north at Feature 1 (right) and Feature 2 (left) .....	D-3
Figure 4.	Site overview facing east-southeast (datum rock pile in lower right) .....	D-4
Figure 5.	Feature 1, looking west (Feature 2 in background) .....	D-4
Figure 6.	Feature 2, looking north.....	D-5
Figure 7.	Sketch map of site 24BH3392 .....	D-6

## CULTURAL RESOURCE DATA RECOVERY PLAN

### INTRODUCTION

Prehistoric occupation site 24BH3392, the Pistol Pete Site, is located on private land within Rio Tinto Energy America's Spring Creek Coal, LLC. The site was found and recorded in 2006 by GCM Services, Inc., Butte (Ferguson and Meyer 2007).

In the 2007 report it was stated that this site met Criterion D of the National Register of Historic Places (NRHP). Site 24BH3392 was recommended NRHP eligible under Criterion D because of its archaeological content and unique shelter remains, consisting of the recognizable remains structures made of stacked juniper logs surrounding central hearth features. Dateable charcoal, bison bone and a variety of tools and lithic materials are additional attributes that make this site exceptional, with potential to yield additional significant information. Figure 1 shows the location of this site on the USGS Quadrangle Map, *Pearl School, Montana* (Photo-revised 1978). The contour interval is 20 ft (6 m).

The site is located in the pine breaks of southeastern in a dissected upland setting on the south side of the Pearson Creek drainage, about three miles west of the Tongue River Valley. Pearson Creek is an ephemeral drainage characterized by narrow, steep sided ravines that are separated by high, flat-topped ridges. Scattered stands of ponderosa pine and juniper grow in the ravines and along the slopes. Outcrops of pale grayish brown shale sandstone and pink scoria are exposed along the ridge tops. The scoria contains porcellanite veins, nodules and gravel, which is a primary source of prehistoric stone tool material integral to the cultural history of the region. Pistol Pete Site occupies the top of a lobe-shaped landform, about 200 meters to the south and 18 m above the Pearson Creek drainage bottom.

The following is a data recovery plan designed to mitigate proposed direct impacts associated with coal mining on 24BH3392. This mitigation will be achieved through collection, excavation and analysis of cultural remains. The secondary objectives, although equally important in terms of the archaeological discipline, are to raise and to help answer broader questions regarding the prehistory of the Pine breaks region.

### PISTOL PETE SITE DESCRIPTION

The cadastral description for 24BH3392 is: SENWSWSESW; N1/2SESWSESW; SWNESWSESW 31 Township 8 South, Range 40 East. The Universal Transverse Mercator (UTM) location of the site datum is 351927 Easting, 4993654 Northing (North American Datum 1927). Figures 2-6 are photographs of the site and Figure 7 is a sketch map of the site. The site form is attached as Appendix A.



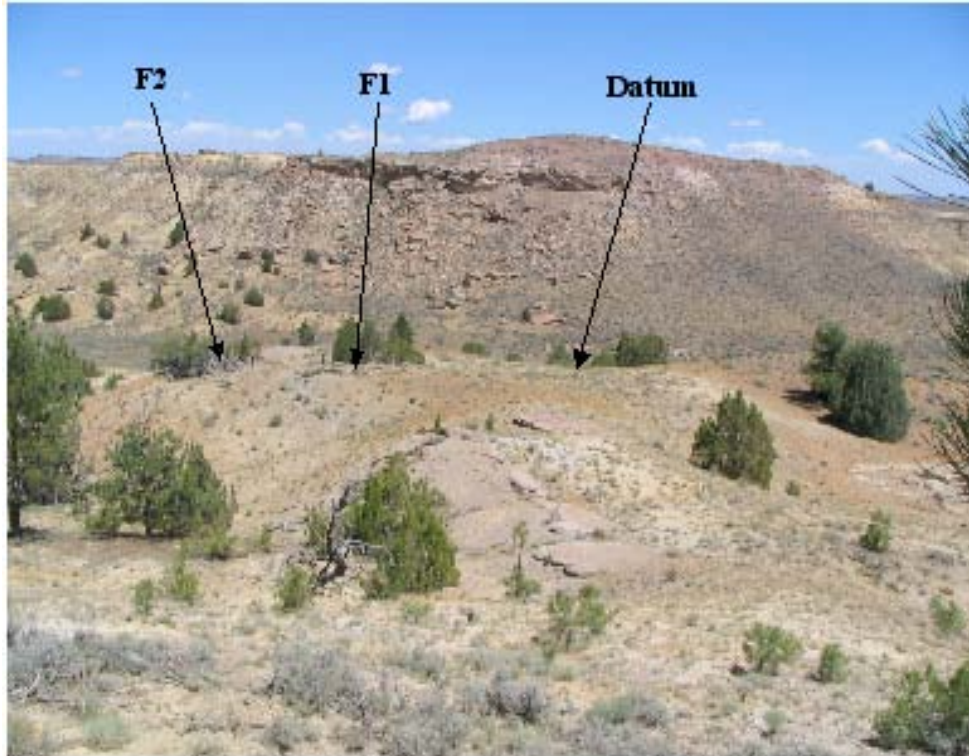


Figure 2. Site overview looking north at landform from the upper bench.



Figure 3. Looking north at Feature 1 (right) and Feature 2 (left).



Figure 4. Site overview facing east-southeast (datum rock pile in lower right)



Figure 5. Feature 1, looking west (Feature 2 in background).



Figure 6. Feature 2, looking north (note: standing dead juniper is not part of the feature)

The Pistol Pete Site area is about 140-m east-west by 70-m north-south, based upon the distribution of features and artifacts observed on the surface. The site is a Late Prehistoric Period campsite consisting of two juniper crib structures, a variety of lithic artifacts and bison bone located on a lobe-shaped projection of the ridge on the south side of the Pearson Creek drainage. The site occupies the top of a lobe-shaped landform overlooking Pearson Creek, ephemeral drainage, about 200 meters to the north, and 18 m below the site. The site also extends to an arroyo bottom on the southeast side of this landform, where a number of bison bone fragments are found.

The soil at the site is pale grayish brown clay loam and weathering sandstone. The cultural deposits are believed to be very shallow, as there is little soil development overlying the sandstone cap rock. Based upon surface observations of the landform, there may be a maximum of 30 cm of depth to the cultural deposits in the central area of the site, with perimeter areas of exposure very near the surface. Again, the underlying sandstone cap rock limits the potential depth of cultural deposits.

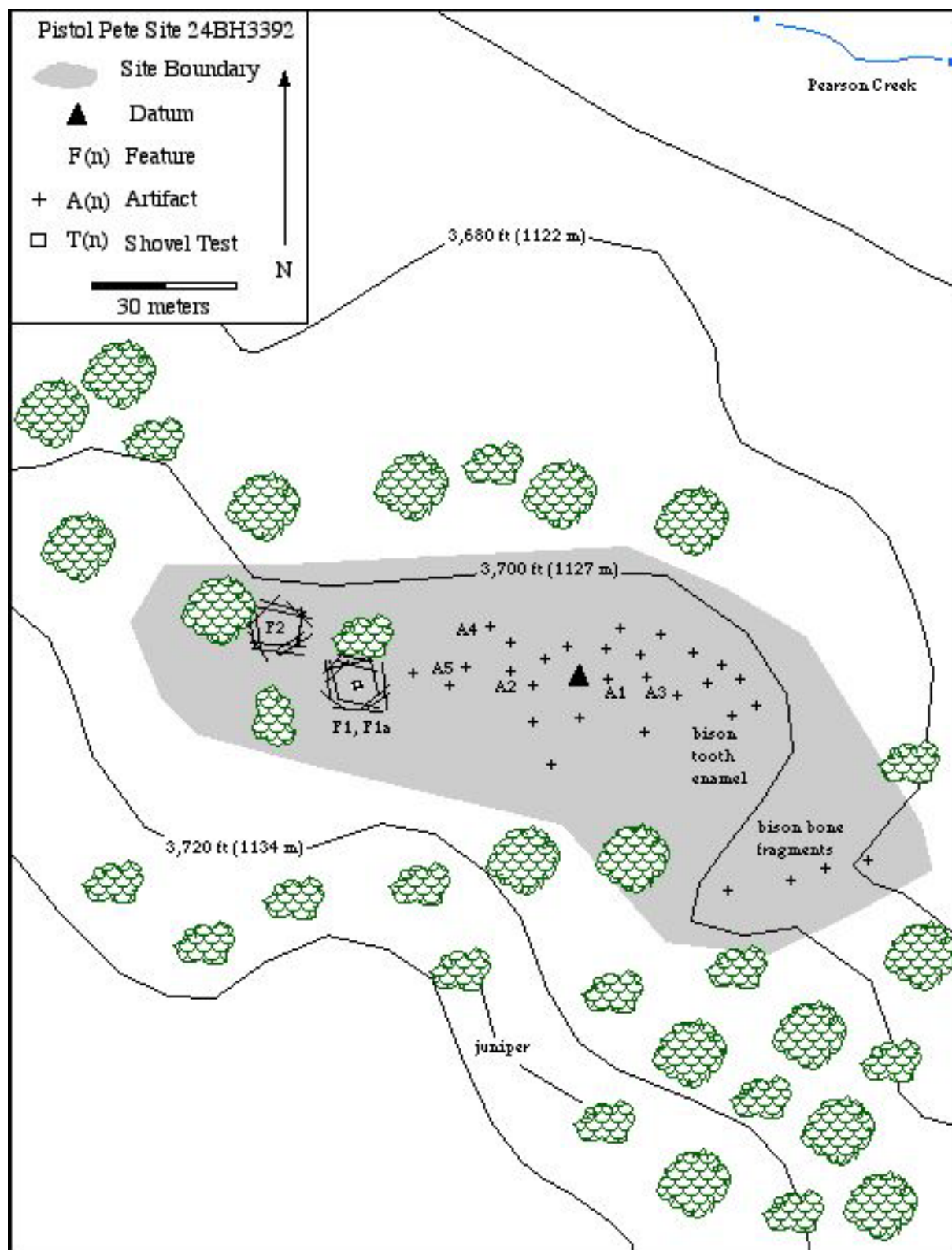


Figure 7. Sketch map of site 24BH3392.

Vegetation types observed at or in the vicinity of the site includes: *Artemisia tridentata* (sage); *Opuntia* (prickly pear); *Yucca glauca*; juniperus; *Phlox hoodii*; *Liatris*; tumble mustard; yellow salsifry; arrowleaf balsamroot; yarrow; prairie smoke; clustered broomrape; flax; chokecherry; hairy golden aster; rabbitbrush; silver sage; thistle; sweet clover; prairie clover; willow leaf sage (sweet sage); globe mallow; gumweed; sunflower; goldenrod; bindweed; buckwheat; hopsage; pussytoes; *Acer negundo*; coneflower; Solomon's seal; jimsonweed; *Ribes* (currant).

Features observed at the site consist of the remains of two shelter structures made of stacked juniper logs. Feature 1 is a vaguely hexagonal-shaped alignment of stacked juniper logs 44 meters west of the site datum. The logs are nearly deteriorated but the remnant log ends are clearly interlaced in log-cabin fashion. The dimension of this feature is roughly 3.5-m north-south by 5-m east-west. A juniper has grown up in the north side of the feature and has disturbed a portion of the feature. In the center of this feature is a 2-m diameter scatter of sandstone fire-cracked rock (FCR), with a 1-m diameter charcoal and ash stain within the FCR scatter (F1a). This is the remains of a hearth feature, which appears to be partially deflated, but which clearly retains sufficient charcoal for a radiocarbon date. Wire pin probing indicates that buried rocks are within the feature.

Feature 2, located 6 m northwest of Feature 1, was not immediately recognizable. What initially appeared to be a tangle of dead juniper was recognized as a second "crib" structure that contains more old juniper logs but is less well-defined than Feature 1 because of the intrusion of a living juniper. This feature is an amorphous tangle of old juniper logs occupying an area of roughly 4 by 4 meters. The feature was identified and confirmed by the presence of sandstone FCR under the tangle of juniper logs. It is believed that Feature 2 is a log "crib" similar to Feature 1, but in a state of greater deterioration.

This type of feature is rare, if not unique, in this area. Unlike cone-shaped wickiups documented in southwestern Montana, these are tentatively interpreted as having been a tipi ring-sized hexagonal shelter constructed of stacked logs (scavenged from the juniper grove surrounding the site). It is presumed that these are Late Prehistoric in age, because of the juniper remains. The logs could be several hundreds of years old when they were collected by the inhabitants, and still have been used hundreds of years ago. A core sample from a standing dead ponderosa pine in Rosebud County, Montana, was radiocarbon dated at 400 $\pm$ 60 years before present (AD 1550) (Beta 41279) by Munson, et al. (1991). Juniper is far more resistant to deterioration than pine, and given the particularly dry environment at this site, could conceivably be much older than that.

Lithic artifacts observed include five formal tools, and about 20 primary and secondary reduction flakes of porcellanite and five chert flakes. Artifact 1 (A1, 2 m at 90 degrees from datum) is a distal fragment of a stage III biface made of siliceous gray quartzite. Artifact 2 (A2, 6.5 m at 270 degrees) is a medial fragment of a small projectile point preform made of Tongue River Silicified Sediment. Artifact 3 (A3, 5 m at 90 degrees) is an end scraper made of brown agate. Artifact 4 (A4, 20 m at 320 degrees) is an exceptionally large end scraper, probably a hand-held variety, made of mottled tan and gray chert. Artifact 5 (A5, 18 m at 280 degrees) is a well worn fragment of a quartzite cobble, possibly a mano and/or hammer stone fragment. Lithic debitage included primary, secondary and tertiary flakes,

predominantly porcellanite, but chert, quartzite and Knife River Flint (“root beer” colored chalcedony) were also observed. No artifacts were collected. Soil deposition at the site is limited to the center of the landform, but pin flag probes there indicate that there is enough soil to have preserved a subsurface cultural component, perhaps 15 to 30 centimeters.

On the southeast margin of the main landform containing the site is a highly erosive arroyo about 6 meters deep. At the head of the arroyo were found several bison bones and bone fragments that bear the attributes of having been butchered and fractured when “green.” It appears that a bison was killed and butchered at this location, perhaps accounting for the site location. Bison tooth enamel is also found on the site about 20 m east of datum.

The site was not shovel tested. Shovel testing could only have a deleterious effect to the rather fragile and shallow cultural component. The site is obviously NRHP eligible and obviously has a significant subsurface cultural deposit. This site is recommended as eligible for the NRHP under Criteria D. The site has significant archaeological content, including unique feature types; dateable organic materials (charcoal, bone and juniper) and a variety of tools indicating that prolonged occupation and various activities (not just lithic reduction) occurred here. Thermal features are present within defined activity areas (e.g., the structures). A variety of lithic materials are present, not just porcellanite. Faunal remains may potentially yield seasonality data. A generally time-diagnostic tool (A2) provides preliminary indication of a Late Prehistoric Period occupation. This site has potentially significant archaeological research potential. It is surficial to shallowly buried and subject to adverse impact from any surface traffic.

## EXPECTED CULTURAL DEPOSIT CHARACTERISTICS AT 24BH3392

The majority of the cultural remains can be expected within the top 10-20 centimeters, however, the cultural horizon may extend to 30 cm level in the interior of the site. Also the bison bones found at the head of an adjacent arroyo may be expected to require excavation to 40 or 50 cm below surface. It is anticipated that the margins of the landform have been subject to erosion and will be determined to have been deflated.

The Late Prehistoric projectile point and presence of juniper features provides a temporal context likely no more than 500 years old. Radiocarbon dating of the charcoal from Feature 1a, as well as the juniper itself, bone fragments and possibly other features will give a broad and comprehensive evaluation of the sites period(s) of occupation. At this time only one period of occupation (affiliated with Late Prehistoric II) is anticipated.

## SITE CONTEXT FOR 24BH3392

No other sites have been excavated along Pearson Creek. However, a few sites have been excavated along drainages to the north, namely Spring Creek and South Fork Spring Creek (Munson, et al., 2003; 1992). Comparisons with the results of these investigations may be

possible. Sites that may offer comparative data are 24BH514, 24BH1048, 24BH2518, 24BH2521, 24BH2529 and 24BH2254. These campsites contain a variety of feature types and artifacts dating from the Middle Archaic to the Late Prehistoric II. It may be possible to compare the Late Prehistoric Period features and artifacts from these sites, as well as also to compare activity loci structures, with 24BH3392.

Also, on the west site of the Little Wolf Mountains two ridge top sites have been recently excavated; Dagan (24BH2622) (Munson and Ferguson 2000) and Minime (24BH2626) (Munson and Ferguson, 2006). These two sites are also examples for a comparison of sites in similar settings.

A comparison of sites containing juniper structure features throughout the Pine breaks region and beyond will be made. Similar structures have been documented in the Pine breaks region of southeastern Montana; many such sites having been described in *Archaeology of Montana*. Juniper wickiups and brush shelters also appear in archaeological literature from Wyoming, Utah, California, Nevada, Idaho and Colorado (Martin 2005). Applicable references will be reviewed and discussed.

## RESEARCH GOALS AND SPECIFIC HYPOTHESES

The research goal is to document and study the apparent juniper features with their attendant thermal features and concentrations of cultural materials, as well as the open space of the site to identify any other features and activity loci. Locating and studying features and activity loci is only a subset of the overall goal of archaeological investigations in southeastern Montana's Pine breaks area which aims to reconstruct the prehistoric settlement and subsistence patterns or what is commonly placed under the rubric "the reconstruction of past lifeways." In order to meet this goal such topics as intra-site patterns, dietary preferences, seasonality and temporal association are addressed. Collection of these kinds of data is important and should always be included in any investigation but the objective of this research design is to go beyond these basic questions and attempt to better define "who" these people were. This is attempted by using activity loci patterns as the basis of cultural division.

The following hypotheses are designed to yield information on a number of important issues including: chronology, cultural affiliation, site function, subsistence, seasonality, site structure and social organization, lithic technology, paleo-environment, and inter-site relationships. Sufficient materials may not be recovered to address all of these research questions. The following hypotheses will be addressed individually for 24BH3329.

## CULTURAL CHRONOLOGY

Hypothesis: Site 24BH3392 is a single component occupation.

Data Requirements: The site will yield similar radio-carbon dates from charcoal, wood and bone sources. The site will yield temporally diagnostic artifacts will corroborate the hypothesis, i.e., a homogenous Late Prehistoric period projectile point assemblage. The excavation will reveal a single cultural stratum.

Criteria for Hypothesis Rejection: Archaeological evidence that the site has statistically diverse radiocarbon dates, a variety of temporally diagnostic artifacts and/or multiple components preserved as distinct cultural strata.

Discussion: The occupation of the Spring Creek / Pearson Creek area may not have been continuous but at varying intervals over the last several thousand years. The site may be a single occupation associated with a single activity or event (such as the killing and processing of a few bison).

## SITE FUNCTION

Binford (1980) set out a criteria for determining functional site types. These types include residential bases, locations, field camps, stations, and caches. These types need not be independent of each other.

Hypothesis: The site is a field camp; a short-term occupation associated with a single activity or event (such as the killing and processing of a few bison).

### Data Requirements:

- (1) Low artifact diversity representative of short-term use and limited activity
- (2) An artifact assemblage focused on bison processing
- (3) A corresponding faunal assemblage limited to bison bone

### Criteria for Hypothesis Rejection:

- (1) Identification of cultural features and work areas representing multiple activities including processing and consumption of plant and animal materials.
- (2) Recovery of a representative sample of artifacts which would have been used for a variety of activities and not just bison processing, such as a large volume of primary lithic reduction debris or the remains of a variety of faunal species
- (3) Evidence of long-term occupation, such as multiple-reuse of thermal features, abundant quantities of fire-cracked rock and multiple strata of cultural deposition.

Discussion: Locating and exposing activity loci will help determine the presence or absence of different activity areas and possibly overall site structure.

## SUBSISTENCE

The procurement, processing and consumption of floral and faunal resources are activities that can be examined archaeologically. These activities are reflected in presence of biological remains (bones and paleobotanical remains). Lithic tools and debitage can provide insight into the subsistence activities, which took place at sites. A full range of subsistence activity data may exist.

Hypothesis 1: Hunting activities will be represented in the site assemblage.

### Data Requirements:

- (1) Recovery of faunal materials from cultural context.
- (2) Recovery of formal artifacts associated with hunting activities.
- (3) Recovery of lithic debitage representing the resharpening of tools used in animal processing.

### Criteria for Hypothesis Rejection:

- (1) No faunal remains are recovered from the archaeological context.
- (2) Lack of artifacts associated with the procurement, preparation, and consumption of animals.
- (3) Lack of lithic debitage associated with maintenance of tools used in animal processing.

Hypothesis 2: Non-hunting related subsistence activity data will not be recovered from the site.

### Data Requirements:

- (1) The site lacks subsistence data related to non-hunting activities.

### Criteria for Hypothesis Rejection:

- (1) Recovery of archaeobotanical remains (e.g., macrofloral remains, etc.).
- (2) Recovery of formal artifacts not associated with hunting activities.

Discussion: Materials from diverse activities should be recovered if the site is a residential base.

## SEASONALITY

Data from certain faunal species can be used to determine seasonality. Mandibular tooth eruption schedules for large mammals with known birthing times can be used to ascertain seasonality, as can fetal bone in recognizable stages of development (Niven and Hill 1998).

Floral materials can also aid in determining seasonality. Carbonized seeds from fruits and berries with known seasonality can suggest seasonality of occupation.

Hypothesis 1: The site was occupied during one season (summer, fall, winter or spring).

Data Requirements: Recovery and analysis of floral and faunal remains indicative of seasonality.

Criteria for Hypothesis Rejection: Floral and faunal remains indicating occupation in multiple (non-adjacent) seasons.

Discussion: It is likely that the site will not contain preservation of seasonally sensitive materials and that seasonality will not be determinate.

## SITE STRUCTURE AND SOCIAL ORGANIZATION

These questions will focus on intra-site analysis. The distribution of activity areas, artifacts, cultural features, floral and faunal remains will be explored. Particular questions that will be important include (1) how many people (approximately) used the site, (2) identification of any gender specific activity areas, (3) identification of specific task areas, (4) estimation of the duration of site occupation, and (5) issues of social hierarchy and social organization.

Hypothesis 1: Activity loci specific to lithic reduction (inferred to be male) and other spatially separate activity loci (e.g., hide processing activities with their inferred female activity association) will be identified.

Data Requirements:

- (1) Identification and analysis of lithic reduction locus.
- (2) Identification of activity loci not directly related to lithic reduction.

Criteria for Hypothesis Rejection:

- (1) Lack of discrete lithic reduction locus.

(2) No discernible, discrete activity areas.

Hypothesis 2: Activity loci specific to plant processing (with an inferred female activity association) will be identified.

Data Requirements: Identification and analysis of artifacts associated with plant processing (e.g., manos, metates).

Criteria for Hypothesis Rejection:

1) No discernible plant processing activity area(s).

2) No artifacts found which were directly related to plant processing.

Hypothesis 3: Activity loci specific to hide processing (with an inferred female activity association) will be identified.

Data Requirements:

(1) Identification and analysis of artifacts associated with hide processing (e.g., scrapers).

(2) Identification of features associated with hide processing (i.e. smudge pits).

Criteria for Hypothesis Rejection: Lack of discrete activity loci associated with materials associated with hide processing.

Hypothesis 4: Activity areas specific to food preparation (and consumption) will be identified.

Data Requirements:

(1) Identification of hearths used for food preparation.

(2) Identification of faunal and/or floral remains in direct association with food preparation activities.

(3) Identification and analysis of artifacts used for food preparation.

Criteria for Hypothesis Rejection:

(1) No hearths found which can be associated with food preparation.

(2) Lack of floral and/or faunal remains.

(3) Analysis of artifacts indicates that none were used for food preparation.

## PALEOENVIRONMENT

Collection of data related to the environment includes faunal and macrofloral samples. The distribution of these types of data in cultural context are not necessarily an ideal representation of the total environment at the time of occupation. However, data collected may contribute to regional paleoclimatic models.

The site is unlikely to have a cultural horizon sufficiently deep to contain a stratigraphic pollen profile.

## INTERSITE RELATIONSHIPS

An attempt will be made to explore the relationship of this site to other local sites, and other regional sites having similar features and periods of occupation.

## GENERAL EXCAVATION PROCEDURES

Standard excavation procedures as described by Heizer (1962), Heizer and Graham (1968) and Fladmark (1976) will be maintained in the excavation of the site. Special methods and techniques, described in the following respective sections, will be utilized when necessary to gather specific data in order to address the research objectives.

## MAPPING

Mapping procedures are employed not only to record the surficial features and topography of the site prior to excavation but also to lay out the scale drawing of feature planviews and profiles. The site will be mapped utilizing transit survey techniques. All mapping will be done from a base datum point.

## THE GRID

Horizontal control will be established by laying out an excavation grid. The grid consists of square excavation units oriented along the true north axes (i.e., N-S, E-W). The grid is established using a horizontal datum point from which regular intervals are numbered 0 to "n", with right angled lines produced from these intervals. Each unit is numbered in relation to datum (i.e., 2N, 8E), the number reference corresponding to the northwest corner of the excavation unit. All artifacts located within the excavation unit will be recorded in reference to the respective NW corner and subsequently in relation to the entire grid. In practice, the grid will be laid out on the surface of the site by stakes, each stake being labeled with the appropriate coordinate.

## VERTICAL CONTROL

Possibly no other aspect of the field data collection procedure is as important in the initial ordering of excavated materials as vertical and stratigraphic control. In order to provide continuous stratigraphic sections, soil blocks will be left to ensure stratigraphic profile control.

Vertical provenience will be maintained by measuring the depth of a line level and measuring tape in relation to the NW corner stake. The elevation of each stake is established in relation to point 0,0 (datum). This method (depth below datum or DBD) establishes a common vertical measuring base for all objects found, regardless of the irregularity of the ground surface. Centimeters below surface (cmbs) measurements will be used where cultural levels are parallel to the surface. These measurements will be achieved in the same manner as DBD but will be based on the surface of the nearest wall instead of the NW corner stake.

An excavation unit is not dug in its entirety but is excavated in systematic levels reflecting either natural or arbitrary layers.

Where stratigraphic levels do not exist, arbitrary levels will be used. The entire pit will be excavated in 5 or 10 cm levels paralleling the natural contour of the ground surface such that the centimeters below surface (cmbs) is the same in all four corners of the unit.

## FEATURES

The exposure of features of any type is a time-consuming task. Once a feature is recognized, it will be cleaned, and its limits defined. The feature will be mapped and photographed throughout its excavation.

All soil removed from hearth and hearth related features will be retained for water separation procedures in order to recover micro-cultural debris for analysis.

In addition to hearth and hearth related features, small clusters of lithic debris are likely to be uncovered. Such clusters will be treated as features so they can be more readily and thoroughly analyzed.

The remains of the juniper structures will be mapped with scaled drawings, photographed and described in detail.

## FIELD NOTES

Each excavator will be responsible for the full and accurate recording of all data in his/her excavation unit. This will include minimally the following:

- 1) Level notes:

- unit coordinates
- level number
- DBD and/or cmbs of the corners of each excavation unit
- description of the level matrix
- possible sources of disturbance
- description of features and artifacts
- description of any ancillary samples taken (carbon, soil matrix, etc.).

2) Floor plan:

scaled map of all significant features, cultural associations and metric change for each level to include unit coordinates.

3) Features:

complete description of cultural material, form, structure and interpretation.

4) Profile drawings:

scaled maps of stratigraphy for both excavation units and features.

In most cases, data forms will be used to record and map levels, features, floor plans and profiles. The use of forms serves to maintain congruity in all excavation recording.

## SITE SPECIFIC EXCAVATION PROCEDURES FOR 24BH3392

The following lists the proposed site specific excavation procedures for 24BH3392:

- 1) Make a contour map of the site based on Spring Creek Coal, LLC's 1:200 scale map with 5 ft (1.5 m) contour intervals.
- 2) Establish a staked grid with east-west and north-south axis across the site to control the horizontal extent of excavations.
- 3) Place 1 by 1 m or larger units at the locations where surface cultural remains and intact soil deposits are observed, expanding the excavations where there appears to be intact cultural horizons.
- 4) The remains of the juniper structures will be mapped with scaled drawings, photographed and described in detail.
- 5) Place 4 by 4 m block excavations at Features 1 and 2. Enlarge the excavation to fully expose any associated activity locus.

- 6) In order to fully explore the site for subsurface cultural remains more subsurface testing is recommended. This may take as much as 10 square meters of testing. The tests will measure 0.5 by 0.5 m. Test areas will include the adjacent small arroyo where bison bone was observed in 2006.
- 7) Testing may expose hearth related features and possibly lithic workshop areas. If such cultural remains are found, they will be fully exposed by hand excavations.
- 8) The total amount of excavation will probably be around 80 square meters. The actual square meters of excavation will depend on the number, extent and complexity of activity loci located.

## GENERAL METHODS OF ANALYSES

Analyses of materials and information obtained from the excavations will be sorted into the various categories and labeled appropriately. The bulk of the analyses and interpretation will be by GCM Services staff. The methods of the analyses are explained below.

### LITHIC ANALYSIS

The lithic analysis will focus on two aspects: predominant technology and inferred cultural behavior. All lithic materials will be initially examined and identified as to material type. Then debitage and tools of each material type will be examined in terms of dominant reduction technologies and progressive sequences of manufacture as indicated by quantities and variations in flake type and rejected tool preforms. Formal tools will be examined in terms of type, function, cultural variation, breakage patterns and attritional wear patterns. In conjunction with intra-site spatial distribution of lithic materials, inferences will be made concerning specialized activities and associated activity areas. The lithic analysis will be conducted by David Ferguson and Viktor Kujawa.

All tools will be sorted into the conventional gross categories of projectile points, end scrapers, drills, bifaces, etc. Standard metric measurements and raw material determinations will be made for each item.

### FAUNAL ANALYSIS

Bones recovered from the excavation will be identified, whenever possible, to element and species. John Rittel, Wolf Creek, Montana, will analyze the faunal material.

## MACROFLORAL ANALYSIS

The flotation of the soil from the features will be done by GCM Services. The light fraction will be sent to Dr. Richard Holloway, Quaternary Services, Flagstaff, Arizona for identification of macro-floral remains.

## POLLEN ANALYSIS

The value of pollen analysis at the sites probably will be limited because of the shallow nature of the cultural deposit and the likelihood of contamination by the modern pollen rain being deposited by such means as drying cracks, downwashing, and burrowing animals. However, if pit features or deeply buried cultural levels are located, soil samples for pollen analysis will be sent to Linda Scott Cummings, PaleoResearch Lab, Golden, Colorado for pollen study.

## WOOD SPECIATION

Charcoal samples from the features will be sent to Dr. Edwin Burke, School of Forestry, University of Montana, Missoula, for species identification.

## RADIOCARBON DATING

Radiocarbon dating will be by Beta Analytic, Inc., Coral Gables, Florida. Whenever there is sufficient charcoal, samples from the same features will also be speciated.

Accurate chronometric dating of Protohistoric sites is critically important in regards to a number of research topics, yet remains one of the key problems. Until the acquisition of steel axes, wood cutting was a highly labor intensive activity. For both fuel wood and shelter poles, long dead wood that could be easily gathered or brought down without tools was far more appealing than living trees. Because of this old wood problem (the fact that both dendrochronological and radiocarbon dates provide only chronometric information on a tree's *death* rather than the year of its use), the resultant dates tend to be from one to three centuries earlier than the cultural utilization of a sample of wood...a distinct problem with resources that are only a few hundred years in age.

## DENDROCHRONOLOGICAL DATING

If possible, constituent juniper elements from Features 1 and 2 will be dated using dendrochronology (tree ring) dating to offset the "old wood" problem described above. Dendrochronology dating will be done by the University of Arizona.

## OBSIDIAN TRACE ELEMENT ANALYSIS

If obsidian is recovered, it will be sent to Dr. Richard Hughes, Geo Chem Research Lab, Portola Valley, California, for trace element analyses. This information is used for the possible source(s) of the obsidian.

## OBSIDIAN HYDRATION BAND ANALYSIS

If obsidian is recovered, Thomas Origer, Sonoma State University, Rohnert Park, California, will conduct obsidian hydration band analysis. The thickness of the band provides information on the age of the specimen when compared to other local specimens.

## PROTEIN RESIDUE ANALYSIS

Selected tools will be sent to Amy Girado, Archaeological Sciences, California State University, Bakersfield, California, for protein residue analysis. This information is used for input on species of animals and plants utilized by the inhabitants of the site.

## CERAMIC ANALYSIS

Ceramics, if found, will be analyzed by Dr. William Lucius, Boulder, Colorado. The analysis includes ceramic characterization as well as the apparent number of vessels represented in the sample.

## FEATURE ANALYSIS

The term "feature" as used in this report defines those physical manifestations that the field archaeologist investigated and described as a separate unit unto itself. Features usually cannot be readily removed from a site without destruction. Generally, features are clearly the result of the inhabitants' activities; e.g., rock-filled hearths and living surfaces.

The features will be placed into categories such as pit hearth, surface hearth, pit oven, dump, and living surface. Their structures, as well as their spatial /contextual relationships will be analyzed.

## SCHEDULE

The excavation of 24BH3392 is not currently scheduled by the project proponent. It is assumed that the excavation will be scheduled upon approval and acceptance of this mitigation plan.

Tentatively, the excavation will be scheduled in the Fall of 2009 or the Spring of 2010. A letter report briefly describing the results of the fieldwork will be submitted within 30 days after fieldwork is completed. The report on excavation results will be submitted to the agencies by one year after completion of fieldwork. Artifacts collected from the site will be housed at the Bureau of Land Management curation facility in Billings, Montana.

## REFERENCES

Fladmark, K.R.

1976 *A Guide to Basic Archaeological Field Procedures*. Department of Anthropology, Simon Fraser University.

Heizer, Robert F.

1962 *A Guide to Archaeological Field Methods*. The National Press, Palo Alto, California.

Heizer, Robert F. and John A. Graham

1968 *A Guide to Field Methods in Archaeology*. The National Press, Palo Alto, California.

Martin, Curtis

2005 *Colorado Wickiups: An Archaeological Context*. Paper presented at the 2005 Colorado Council of Professional Archaeologists Annual Meeting, Grand Junction, Colorado, March 4-5, 2005.

Meyer, Garren and Gene Munson

1998 *Archaeological Investigations at Another Site, 24RB1605*. Prepared for Big Sky Mine, Colstrip by GCM Services, Inc., Butte, Montana.

Munson, Gene, et al.

2003 Excavation of Lost Hearth 24BH2254. With contributions by Richard Holloway, Dave McKee, Beta-Analytic, Laboratory of Archaeological Science and Richard Hughes. Report prepared for Spring Creek Coal Company, Decker, Montana, by GCM Services, Inc., Butte

1992 Archaeological Investigations at 24BH514, 24BH1048, 24BH2518, 24BH2521 and 24BH2529. Prepared for Spring Creek Coal Company by GCM Services, Inc., Butte.

Munson, Gene and David Ferguson

1994 *Archeological Investigations at Windmill Site 24RB1606*. With contributions by Gary Wendt, Ann Johnson, William Lucius, Stephen Aaberg, Jack Fisher, Edwin Burke and Kathryn Puseman. Prepared for Peabody Coal Company by GCM Services, Inc., Butte.

2000 *Excavation of Dagan Site, 24BH2622*. With contributions by Margaret Newman, Darrel Myran, Dave McKee, Richard Holloway, Edwin Burke and Alan Cvancara. Report prepared for Westmoreland Resources, Inc., Absaloka Mine, Hardin, Montana, by GCM Services, Inc., Butte.

2007 *Excavation of Minime Site, 24BH2626*. With contributions by Margaret Newman, Darrel Myran, Dave McKee, Richard Holloway and Edwin Burke. Report for Westmoreland Resources, Inc., Absaloka Mine, Hardin, Montana, by GCM Services, Inc., Butte.

Niven, Laura B. and Mathew Glenn Hill

1998 Season of Bison Mortality at Three Plains Archaic Kill Sites in Wyoming. *Plains Anthropologist*, 43(163) 5-26.